F. Preserve Management

As an urban preserve plan for wildlife, the HMP will enhance the region's quality of life, providing the Carlsbad community with recreational and educational opportunities while conserving its unique biodiversity and maintaining populations of sensitive resources. To succeed in these goals, the HMP will require management practices and some land use restrictions on conserved lands that give special consideration to the interface between developed lands and open space. Adaptive management measures and good land use planning will minimize impacts to individuals or populations of covered species from development abutting the preserve.

1. Interim and Permanent Management

The HMP preserve system will be assembled over time as the City of Carlsbad builds out. Thus, there is a need for interim arrangements to manage existing conserved habitat areas, as well as arrangements for management of the completed preserve system in perpetuity.

Interim management will cover the first three years following approval of the HMP. Management activities will generally be the responsibility of the owners of the conserved lands unless other arrangements have been provided. For example, the City of Carlsbad will manage City-owned conserved lands, and private property owners will manage their conserved lands.

During the three year interim period, a plan for permanent management will be developed by the City in cooperation with existing reserve managers, private owners of conserved lands, and the wildlife agencies. The permanent management plan will seek to consolidate existing long-term funding sources for management and may establish new funding sources. An example of a new funding source would be endowments funded by private development projects that involve impacts to habitats.

The conserved lands within the HMP will be owned and managed by various public and private entities. For many of these properties, management funding and arrangements are already in place. Although these individual ownerships and/or management arrangements may later be delegated to a unified management scheme for the HMP or MHCP, the management arrangements described below will remain in place at least on an interim basis. In some cases, such as land owned by the State of California, the arrangements described below and as shown on Figure 31 are likely to be the permanent ownership and management arrangements.

A. STATE OF CALIFORNIA

The State of California owns a significant amount of land under a number of agencies and departments.

1) The **University of California** owns the Dawson-Los Monos Reserve which lies partially in LFMZ 15 and partially in the City of Vista. The Reserve is approximately 163 acres in size within Carlsbad. The UC system through its budgetary processes has in the past funded ongoing maintenance and management. Employees or contractors of the UC system carry out actual management activities. Some volunteer labor may also be provided. It is assumed that the UC system will continue to fund such activities and carry out the management function.

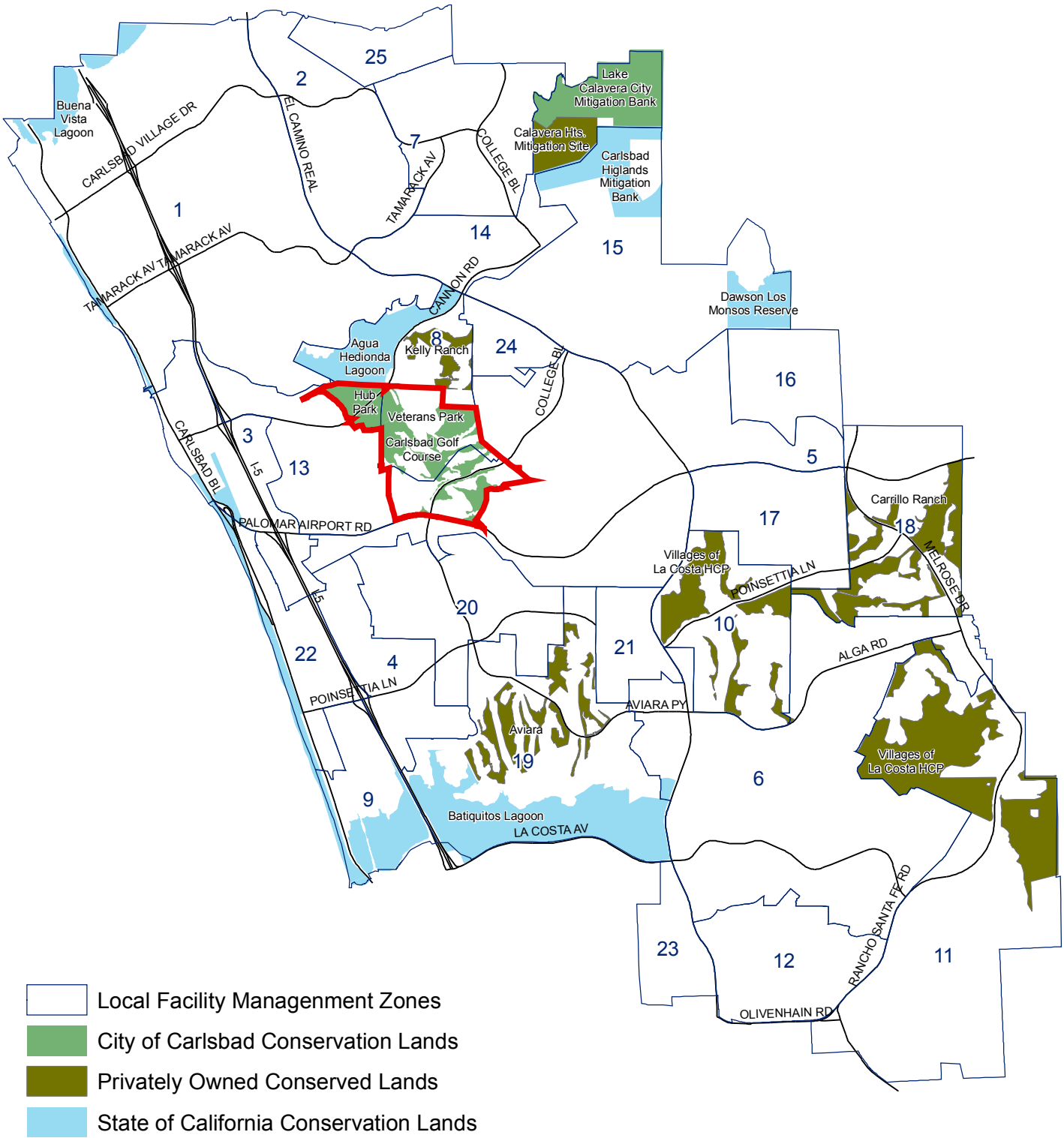

Figure 31
Existing Management Of Preserve Lands

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2) The **Department of Fish and Game** owns the wetland area of Batiquitos Lagoon and Buena Vista Lagoon. In addition, there is an irrevocable offer to dedicate approximately 200 acres of wetlands at the eastern end of Agua Hedionda Lagoon to the department. Batiquitos Lagoon was the subject of an enhancement effort funded by the Port of Los Angeles as mitigation for Port construction activities. The Port has established an endowment in the amount of $8 million to fund ongoing management of Batiquitos Lagoon. No such endowment exists for Buena Vista and a small endowment has been established for Agua Hedionda as a result of Cannon Road. The City will cooperate with the Department of Fish and Game in efforts to assemble adequate and additional endowment amounts for these two lagoons. The Department also owns and manages approximately 180 acres in the Carlsbad Highlands Mitigation Bank. An endowment for management was included in the sale of mitigation credits.

3) The **State Parks Department** owns 35 acres along the immediate coastline of Carlsbad, known as South Carlsbad State Beach. Some portions of South Carlsbad State Beach contain Maritime Succulent Scrub or other sensitive habitats, or areas that are potentially restorable. The State Parks Department currently maintains and manages all of its land through funds derived from the state budget. It is assumed that this funding will continue. Employees or contractors of the State Parks Department currently carry out actual management activities, and that arrangement is likely to continue.

B. CITY OF CARLSBAD

The City (or its subsidiary districts) owns several properties that will be part of the HMP preserve system. The properties are described below. Funding for management of all of these properties will be provided through the City's annual budget process. Funding for management is estimated to be $75 per acre per year, although the funding in any given year may fluctuate due to management needs or the availability of unobligated funds. Prior to preparation of the long term management plan, management activities will focus on maintaining existing habitat values, and will include trash removal, basic access controls, and fire prevention.

1) The **Lake Calavera** property is located in the northeastern corner of the City in LFMZ 14. Approximately 266 acres are being placed in permanent conservation as a mitigation bank for City public works projects. Minimal management is currently being provided, funded as part of the operating budget of the Carlsbad Municipal Water District (CMWD), and management activities are currently carried out by employees or contractors of the District. As City projects utilize mitigation credits from this bank, an endowment amount will be deposited in a fund to provide for long-term management.

2) Portions of the **Municipal Golf Course** totaling approximately 50 acres have been committed to permanent conservation as part of the HMP. Minimal management activities are currently being provided, funded as part of the operating budget of the Parks Department. Upon construction of the golf course, a higher level of management will begin, with funding provided annually through the City's budgetary process as part of the operating budget for the golf course itself.

3) The **Veterans Memorial Park and Hub Park** properties, though not contiguous, can be considered as one unit for management

purposes. Veterans Memorial Park is City owned land. Hub Park is owned by San Diego Gas and Electric (Sempra Energy), and the City holds a long-term lease on the property. Portions of each will be used for active or passive park uses, and approximately 100 acres is being contributed to permanent conservation. Minimal management is currently being provided. Upon approval of the HMP, a higher level of management will be provided. Upon construction of park improvements, the full management program will be instituted. Funding will be provided through the City's annual budgetary process for the Parks Department.

C. PRIVATELY OWNED CONSERVED LANDS

1) **Villages of La Costa**. This property, formerly owned by the Fieldstone Company, is covered by a Habitat Conservation Plan that was approved in 1995. That HCP addresses management provisions, and the reader is referred to that document for further detail. (Fieldstone HCP Implementing Agreement Section V.) In summary, management activities are currently limited in scope and are the responsibility of the property owner. At the time of the first development impacts within the plan area, the conserved lands must be dedicated to an appropriate conservation entity, along with recordation of a conservation easement, and full management activities must commence. An endowment of approximately $1 million is required to fund management in perpetuity.

2) **Calavera Heights Mitigation Property**. In 1993 this approx. 110 acres parcel in northeast Carlsbad was purchased by the developer of Villages Q and T of Calavera Heights as mitigation for the impacts of constructing those two villages. Approximately $93,000 was deposited with the City to cover startup costs. A mitigation agreement between the City and the developer provides for the possibility of an endowment to cover long-term management (Mitigation Agreement dated March 15, 1993, between the City of Carlsbad and Lyon/Copley Carlsbad Associates). In 1998 the developer donated title to the mitigation parcel to The Environmental Trust (TET), a local non-profit conservation entity. An Open Space easement in favor of the City has been recorded. Management activities are now being carried out on a limited basis by TET utilizing the startup funding. Provisions for the long-term endowment will be considered within the next 2 years and will be incorporated into the final HMP Management Plan.

3) **Aviara Open Space**. The Aviara Master Plan area dedicated approx. 244 acres to permanent conservation. Deed Restrictions have been placed on the conserved areas. Currently, funding and actual management for the conserved areas are provided by the Aviara Master Home Owners Association (Final Maps for CT 85-35, Units A - E; CT 89-37; and CT 92-03). For long-term management, two alternatives are possible. The Master HOA could continue to fund and carry out management, or arrangements could be made between the City and the Master HOA to allow the conserved areas to be managed as part of the unified HMP management program, should one be developed.

4) **Rancho Carrillo Open Space**. This Master Plan dedicated approx. 182 acres to permanent conservation. Open Space easements in favor of the City have been recorded. Currently, funding and actual

management for the conserved areas are provided by the Rancho Carrillo Master Home Owners Association (Final Map for CT 93-04). For long-term management, two alternatives are possible. The Master HOA could continue to fund and carry out management, or arrangements could be made between the City and the Master HOA to allow the conserved areas to be managed as part of the unified HMP management program, should one be developed.

5) **Kelly Ranch Open Space**. This recently approved major project will dedicate significant conserved lands to the preserve system. Approximately 200 acres of wetlands is the subject of an irrevocable offer of dedication in favor of the California Dept. of Fish and Game, as described previously on Page F-5. However, no funding for management was attached to that offer of dedication. In addition, approx. 53 acres of upland habitats will be committed to permanent conservation. Minimal management is currently occurring. Prior to commencement of grading, an open space easement over the conserved lands will be dedicated to the City. Funding for management of the conserved uplands will be provided by the Kelly Ranch Master HOA (Tentative Map CT 97-16 and Final Map CT 96-07). For long-term management, two alternatives are possible. The Master HOA could continue to fund and carry out management, or arrangements could be made between the City and the Master HOA to allow the conserved areas to be managed as part of the unified HMP management program, should one be developed.

2. Management and Monitoring Actions

This section provides a framework for consistent and coordinated management of the current and future preserve areas. Management goals specific to each local facilities management zone are also provided at the end of this section. Area-specific management directives will be developed in accordance with this framework plan and the zone-level goals to address management issues at the site-specific level. Area-specific management directives will be prepared as lands are conserved and incorporated into the preserve and will include any species-specific management required as conditions of the take authorizations.

This framework management plan generally addresses the following management actions:

- Habitat restoration and revegetation
- Hydrology and flood control
- Recreation and public access
- Species reintroduction
- Enforcement
- Adaptive management
- Monitoring

Management on some of the preserve areas will be minimal, consisting primarily of enforcing land use restrictions, such as off-road vehicle restrictions, no-hunting regulations, and other existing ordinances or regulations. Some of the smaller, more fragmented preserve areas may require more active management to achieve their biological potential as part of the preserve system. The majority of the preserve is currently constrained by adjacent development and disturbed habitat areas. Some of

these areas will require active habitat restoration or enhancement to protect or improve their value as habitat linkages and wildlife movement corridors.

A. Habitat Restoration and Revegetation

Management Issues

Restoration is the process of re-establishing or enhancing historic biological functions and values to degraded habitats. Restoration methods range from active revegetation to passive management. Generally, labor-intensive restoration methods involving active landscaping take less time to achieve biological goals but at greater cost than more passive management techniques, such as fencing to limit further disturbance.

Active revegetation and restoration projects rely on techniques that encourage natural regeneration or use intensive horticultural methods such as planting, seeding, transplanting, and salvaging. The source of seeds and plants used for such projects has tremendous genetic implications. Non-local planting stock can introduce novel, undesirable, or maladapted genotypes into the ecosystem. Use of non-local stock may also result in mortality or problems with growth and reproduction. Thus, active restoration programs should use propagules from sources close to the restoration site.

Management Recommendations

Although large scale restoration projects are not planned nor required by the HMP, restoration is necessary to enhance linkages and disturbed habitats and should include reintroduction of native species and eradication of nonnative ones. Project-specific mitigation plans should identify where restoration is most needed. Appendix C identifies restoration priorities based on the need for connectivity, territory size, and the potential to enhance habitats of sensitive species. Restoration feasibility should be based on an assessment of the level of effort required, costs, access, physical factors, biological conditions, and adjacent land uses.

Restoration plans should be prepared where active revegetation methods are proposed, with formal construction documents and seed and plant procurement specifications. Propagules should be utilized only from sources near the restoration site. Site protection, irrigation, and maintenance standards should be specified, along with monitoring, success criteria, contingency measures, and exotic species removal to ensure that restoration is successful.

Where revegetation is proposed as part of a project-specific mitigation plan, a detailed restoration management plan should be prepared according to the following guidelines:

1) Evaluate Restoration Needs and Feasibility

- Identify and prioritize potentially restorable areas based on HMP conservation objectives (see also Appendix C).

- Evaluate potentially restorable areas based on the level of effort and cost needed to restore them as functional habitat. Cost estimates should include implementation and monitoring efforts.

- Assess existing site quality, site access, adjacent land uses, difficulty of achieving restoration goals, and cost of available restoration techniques appropriate to the site conditions.

- Assess the physical factors of the restoration sites, including topography, slope, aspect, elevation, drainage, soils, hydrologic regime, and climatic regime.

- Assess existing biological conditions, past management practices, and sources of disturbance.

- Collect reference data from an adjacent or nearby habitat in good condition to serve as a planning guide and as a subsequent comparison with monitoring data from the restoration site.

2) Develop Mitigation Plans for Proposed Restorations

- Develop a conceptual mitigation plan, followed by formal plans and specifications for those areas in which active revegetation methods (installation or maintenance) are proposed. Identify restoration goals and objectives, restoration design criteria, project management and implementation responsibilities, scheduling constraints, planting materials, equipment constraints, evaluation criteria, and remedial measures. Most restoration plans will be a combination of long-term management changes combined with more active landscaping where feasible.

- Develop formal construction documents that address the specific responsibilities and authorities of applicable personnel (e.g., the land manager, contractors, monitors, etc.). Specifications should include all pertinent conditions, coordination requirements, schedules, warranty periods, protected areas, and restricted activities. These plans will be installed by a registered landscape contractor or a qualified ecological restoration specialist, whichever is most qualified, although volunteer help may be used if correctly supervised.

- Specify seed and plant procurement procedures at least a year in advance of actual planting. Do not allow species substitutions unless approved by the project restorationist. Integrate genetic conservation consi-derations (Center for Plant Conservation 1991; Brown and Briggs 1991) into procurement specifications.

- Require exotic plant control and debris removal prior to restoration planting and during establishment of the plantings. Exotic plant control specifications should describe techniques, target species, safety precautions, and compliance with laws and regulations. Such specifications must be developed by a licensed pest control advisor if chemical controls are recommended.

- Utilize mycorrhizal fungi, where appropriate. A mutualistic relation-ship exists between plant roots and mycorrhizae. Certain plant species benefit from increased ability to take up nutrients and withstand drought when mycorrhizae are present. Site disturbances, especially the removal or disturbance of the top soil layers, can cause mycorrhizae to die out on a site. Weed invasion can further lower

mycorrhizal presence in the soil. Mycorrhizal inoculation of the soil will reintroduce the fungi to sites where it has been lost. Such inoculation can be accomplished through planting inoculated container plants or the introduction of litter, duff, or soil from an infected site. The best source of mycorrhizal fungi is salvaged topsoil taken from an infected site, although the fungi can be killed if the soils are stored improperly. Topsoils may also contain other essential ecosystem components such as humus and soil fauna.

- Specify irrigation necessary to establish restoration plantings. Irrigation operation specifications should also include system maintenance and coverage monitoring. Irrigation of restoration projects differs from conventional landscaping where irrigation is provided indefinitely. In restoration projects, the goal is to aid plant establishment to the point that the plants become self-sufficient on natural sources of precipitation. Some types of restoration may not need irrigation.

- Delineate site protection measures both during construction and afterward during the establishment period. Protection may include the use of fences, flagging, signs, trails, patrols, and other barriers. Protection of the site often requires management of offsite resources and contaminants, drainage, exotic plant species, vandalism, and trash.

- Establish maintenance standards to ensure restoration success. Intensive maintenance at least once a month during the first two years after planting is usually required and may include irrigation, weed control, debris removal, replanting, reseeding, staking, erosion control, fertilization, pest control, and site protection. Maintenance should be conducted until the plants have demonstrated that they can sustain themselves (generally 3-5 years) without significant maintenance such as irrigation or weeding.

3) Develop a Monitoring Program

- Monitoring program will be developed in consultation with Fish and Game and the Fish and Wildlife Service to be consistent with other NCCP monitoring plans.

- Where any active revegetation is necessary to accomplish restoration goals, provide clearly defined contractor education and construction monitoring programs to ensure proper installation and maintenance and to protect sensitive resources adjacent to the restoration area.

- Establish long-term biological and horticultural monitoring programs following restoration landscaping.

  Biological monitoring: Collect field data to assess whether project goals are being met, including species composition, mortality of plantings, cover at different vegetation levels, species distribution and diversity, and wildlife monitoring. Collect similar data from reference sites for comparison.

  Horticultural monitoring: Supervise the actions of the maintenance contractor and recommend remedial actions to ensure proper

erosion control, debris removal, weed and pest control, irrigation scheduling and cessation, and protective fencing.

- Specify performance standards by which the restoration will be judged. These are usually developed from a combination of existing reference site data and prior measurements in other restoration endeavors. Design monitoring of restoration sites to supply data to evaluate these standards. Develop remedial measures in advance of project implementation should performance standards not be met.

B. Recreation and Public Access

Management Issues

Public access is appropriate in selected areas of the preserve to allow entry to recreational areas and promote understanding and appreciation of the natural resources. Excessive or uncontrolled access, however, can result in habitat degradation through trampling and erosion (e.g., along trails) and disruption of breeding and other critical wildlife functions at certain times of the year.

Passive recreational activities (e.g., hiking, bird watching) are anticipated within the preserve and are generally compatible with HMP conservation goals. In general, passive activities pose a significant threat to biological resources only when the level of recreational use becomes too intense. Active recreational activities such as picnicking, and mountain biking may also occur in or adjacent to the preserve, if restricted to selected areas, as determined by the Management Plan in consultation with the Wildlife Agencies. These activities are conditionally compatible with biological objectives.

Most active recreational uses require some additional level of development, such as access roads, parking lots, service facilities, maintenance buildings, and landscaping. Construction of these facilities can cause habitat fragmentation and can result in increased traffic, auto emissions, and petrochemical runoff; pesticide and fertilizer runoff; use of invasive nonnative plants in landscaping; use of outdoor lighting; and changes in local drainage patterns. These activities may have adverse impacts to air and water quality as well as wildlife use of the area and should not be sited within the preserve boundaries.

Adverse impacts of off-road vehicle use include reductions in air quality due to automotive exhaust and creation of dust, soil erosion and sedimentation into local waters, noise, and habitat degradation. Disturbance from off-road vehicles can also disrupt breeding activities. For these reasons, off-road vehicle use is not compatible in the preserve.

Management Recommendations

Although the primary purpose of conserved lands is protection of plant and wildlife species, some types of recreational uses can be appropriate within the preserve system. Recreational uses of the preserve, where allowed, must be consistent with the protection and enhancement of biological resources. Existing recreational facilities should be managed to promote the maintenance of habitat value surrounding these facilities. New recreational facilities or uses will be considered based on the following guidelines:

1) Follow Guidelines for Future Recreational Expansion

- Recognize that conservation is the first priority for the preserve system; new recreational uses can be allowed only where compatible with the conservation objectives.
- Determine appropriate levels of activity within the preserve, depending on the resources to be protected, season, and successional stage.
- Avoid construction or excessive recreational activities on highly erosive soils or implement appropriate erosion control measures.
- Ensure proper drainage of roads and parking areas to prevent erosion.
- Use native species for landscaping at the edges of the preserve, and avoid the use of nonnative invasive plant species.
- Locate roads, trails, and other recreational use areas away from sensitive or high value biological areas.
- Require dust, erosion, and noise controls on new recreational construction.
- Require lighting use restrictions consistent with existing city lighting guidelines within 200 feet of the preserve. Direct lighting in adjacent areas away from the preserve.

2) Develop a Recreation Plan or Review Existing Plans for Compliance

- Identify opportunities and constraints to future recreational use development and for monitoring existing recreational activities that are consistent with biological goals.
- Concentrate facilities in disturbed areas or lower quality habitats away from sensitive plant populations or sensitive breeding areas.
- Develop design standards for new trail construction that address the avoidance of sensitive species, unique habitats, erosion control, and developed access to major features.
- Establish a volunteer program to patrol the trails and monitor use of the preserve.
- Emphasize the use of "fire-safe" native plants in landscaping along preserve edges. Prohibit the use of invasive exotics, and adopt an exotic plant control plan.
- Require any recreational construction projects to control dust, noise, and erosion, and to adhere to seasonal and time-of-day restrictions.

3) Specific Recreational Activities

- Passive Uses

- ◊ Limit or restrict passive uses in critical wildlife areas during the breeding season, as determined appropriate.

- ◊ Minimize adverse effects of passive recreation, such as trampling vegetation and erosion.

- ◊ Provide litter control measures, such as closed garbage cans and recycling bins, at access points for the preserve.

- Day Use

  - ◊ Site picnic areas or other day use facilities at the edges of the preserve lands or in buffer zones.

  - ◊ Collect garbage frequently and instruct day users not to feed wildlife.

- Mountain Biking

  - ◊ Limit mountain bike trails to areas not highly susceptible to erosion and out of wetlands and other sensitive areas.

  - ◊ Construct trails wider than foot trails (minimum 6 feet) to prevent trail edge disturbance and on grades no greater than 25 percent.

  - ◊ Rotate bike use by closing trails periodically to prevent trail degradation if a problem develops.

  - ◊ Construct barriers to restrict access to sensitive areas.

4) Public Access

- Ensure that public access of the preserve is consistent with the protection and enhancement of biological resources. Monitor existing access areas to ensure that they do not degrade or inhibit biological values, and prioritize future access areas for protection of biological resources.

  - ◊ Seasonally restrict access to certain trails if deemed necessary to prevent disturbance of breeding activities.

  - ◊ Close unnecessary trails to minimize biological impacts. Abandon and revegetate steep eroding trails.

  - ◊ Locate new trails away from sensitive resources or restrict their use.

  - ◊ Construct trails to any prominent features or viewpoints that are likely to attract hikers, thereby preventing extensive trampling and compaction.

  - ◊ Install waterbreaks on steep trails to prevent accelerated runoff and erosion.

◊ Establish patrols to identify trail maintenance needs, garbage, vandalism, and habitat degradation.

C. Hydrology and Flood Control

Management Issues

Native habitats have evolved based, in part, on the distribution and flow characteristics of water. Key water-related issues potentially affecting the preserve include the magnitude, quality, and duration of flows; episodic disturbances; and sediment transport.

The seasonal and annual variations in the flows of many streams and coastal lagoons have changed over the years as a result of flow regulation, discharge of treated effluents, groundwater pumping, channelization, agricultural and urban runoff, and reservoir construction. Urban runoff and treated effluent discharges can contribute toxic substances to surface waters, and channelization can alter sediment transport regimes which can change certain habitat characteristics and quality.

Episodic disturbance associated with floods, extensive wildfires, or large landslides are characteristic of channels and riparian corridors in coastal watersheds. These events periodically establish new bed conditions and patterns of habitat along drainages. The frequencies and magnitudes of disturbance will often determine the composition and structure of habitats along drainages, and disturbance is integral for maintenance of high wildlife quality in many habitats.

Sediment transport in drainages can be altered by factors such as mineral extraction operations, upland land uses, control structures, channelization, and habitat alteration.

Management Recommendations

1) Magnitude, Quality, and Duration of Flows

- Maintain existing natural drainages and watersheds and restore or minimize changes to natural hydrological processes.
- Evaluate proposed structures and activities for effects on hydraulics, and implement remedial actions as needed.
- Use Best Management Practices both within and outside the preserve system to maintain water quality.

2) Episodic Disturbances

- Design construction within and adjacent to preserve areas to accommodate large floods and debris flows.
- Design detention basins with earthen berms to allow growth of natural vegetation.

3) Sediment Transport

- Prohibit mineral extraction operations within and upstream of preserve areas.

D. Species Introduction

Management Issues

Species reintroduction refers to relocating a sensitive plant or animal species into native habitat within its historic range to enhance species survival. Reintroduction can be costly and is not yet widely conducted or overly successful. Although *in situ* conservation is always more desirable than reintroduction, reintroduction may be the only hope for species on the brink of extinction.

Management Recommendations

Reintroductions will require appropriate federal and state permits and should only be conducted at their recommendation. The decision to reintroduce a species depends on a number of species-specific and site-specific factors, and reintroduction requires detailed planning and monitoring.

E. Enforcement

Issues

Enforcement programs are needed to ensure compliance with land use plans and restrictions, such as zoning, and to ensure that recreational uses are compatible with preserve goals.

Recommendations

Access control and other restrictions within the preserve should be strictly enforced. The City of Carlsbad and preserve managers should work together on a public education program to explain goals and regulations as well as educate the public on the area's resources. The ultimate level of enforcement lies in the implementing agreement with the wildlife agencies, because degradation of resources could result in loss or revocation of federal and state take authorizations.

F. Adaptive Management

The adaptive management approach requires adjusting management activities to reflect changes in the populations or conditions being managed. This requires periodic updating of the information on which management decisions rely. Preserve managers should monitor populations of some covered species on a regular basis to determine their status and trends, and to determine whether remedial actions are necessary.

In addition, the NCCP process and conservation guidelines require periodic surveys of covered species populations and their habitats. These surveys should supplement existing project-specific monitoring activities in Carlsbad, such as at Batiquitos Lagoon. Carlsbad will also participate in the subregional monitoring plan developed as part of the MHCP process. This monitoring effort is expected to be implemented as part of the regional NCCP monitoring program.

G. Monitoring

Monitoring of the performance of the preserve system is important in determining whether management activities are meeting their objectives. It includes methods for assessing the habitat quality of conserved lands, estimating populations of species, and coordinating local data with region-wide data. As with other aspects of the overall management program, there is a need for both interim arrangements and long-term arrangements. Interim monitoring, during the first three years after approval of the HMP, will be limited to annual reporting as described in section E.5. A long-term monitoring component of the Management Plan will be coordinated with other regional monitoring efforts, and will be designed to function as either a stand alone Carlsbad program or a component of the North County MHCP.

3. Adjacency Standards

The HMP will result in an urban wildlife preserve system in which conserved habitat areas are adjacent to development of various types. In order to prevent negative effects of either area on the other, these adjacency standards must be addressed in the planning of any development/habitat interface:

- Fire management
- Erosion control
- Landscaping restrictions
- Fencing, signs and lighting
- Predator and exotic species control

A. Fire Management

Management Issues

Fire management must accomplish two potentially different objectives: (1) achievement of biological resources goals, and (2) hazard reduction for humans and their property. Biological resources goals recognize that fire is a natural process in ecosystems. Many vegetation communities in the study area depend on a regular cycle of burning for maintaining a balance of species, seed viability, and reproduction. The natural fire cycle is affected by human activities, both by increasing fire frequency in some locations and decreasing it in others through fire prevention measures.

Fire management for human safety is one of the City's highest priorities. With proper planning, this can be accomplished in a manner that is compatible with conservation of biological resources. Fire management for human hazard reduction involves providing adequate setbacks for new development from conserved habitat areas, educating the public regarding effective fire prevention methods, reducing fuel loads in areas where fire may threaten human safety or existing development, suppressing fires once they have started, and providing access of fire suppression equipment and personnel.

Management Recommendations

A detailed fire management plan should be prepared by the City so that both biological and safety goals are met. Brush management to reduce fuel and protect urban uses will occur where existing development is adjacent to the preserve. The fire management plan should, to the degree feasible, be

consistent with the recommendations of the Wildland/Urban Interface Task Force. It should:

1) Identify potential fuel reduction zones or firebreak locations as well as access routes for fire equipment in the event of wildland fires that pose safety concerns.

2) To the degree feasible, site fuel reduction zones, firebreaks, and access routes to avoid sensitive biological resources, preferably at the top or bottom of a slope rather than across a slope. Use existing firebreaks (e.g., natural ridge lines, roads, fire roads) where available.

3) In smaller fragmented preserve areas, manage fuel loads primarily for human safety, using mechanical fuel control measures such as chopping, crushing, disking and chaining, removal, and herbicides. Additional methods of value in smaller areas include mowing, trimming, and hand clearing. In general, chopping and crushing are the recommended methods based on biological and fuel reduction values and safety concerns. Crushing with a device called a "sheep's foot" may be an alternative form of fuel control in some situations.

4) In larger preserve areas, such as in northeast and southeast Carlsbad (Core Areas 5 and 7), manage both for biological resources needs and for safety considerations. Use prescribed burning, where practical, given safety and cost considerations. Fire management practices should be based primarily on the risks of uncontrolled wild fire in proximity to developed areas.

Where preserve areas are planned adjacent to existing developed areas, the fuel management zone may encroach into the preserve. Where new development is planned, brush management will be incorporated within the development boundaries and will not encroach into the preserve.

B. Erosion Control

Management Issues

Erosion is promoted by the combination of erodible soils, steep slopes, soils with low water-holding capacity, sparse to no vegetation, and hydrologic condition of the soils. Erosion can be aggravated by human disturbance and fire-control activities. Erosion hazards to biological resources include pollution and sedimentation of important water sources and the loss of vegetative cover from landslides.

Management Recommendations

1) Identify and Prioritize Areas for Erosion Control

- Identify areas of moderate to severe erosion within and adjacent to the preserve;
- Determine causes of erosion; and
- Rank identified erosion areas according to threats to biological resources. Include an assessment of cost for erosion control measures.

2) Develop Erosion Control Plans

- Develop and implement an erosion control plan for high priority erosion control areas. In general, this will include establishing physical features to slow surface flow and dampen initial precipitation impact, and revegetation of eroded surfaces for long-term protection. In steep areas, rock areas, and areas of high storm flow, permanent rock or concrete revetments may be required to stabilize undesirable erosive forces.

3) Address Slope Stabilization and Surface Drainage

- Prepare contingency native seeding plans for highly erosive areas temporarily disturbed by fire.

- Prohibit bare surface grading for fire control on slopes. Ensure that all techniques implemented for fire control leave (or replace) adequate vegetation cover to prevent surface erosion.

- Ensure that all areas identified for revegetation are adequately stabilized by either a binder or straw cover after planting to minimize surface erosion.

- Ensure that no new surface drainage is directed into the preserve.

C. Landscaping Restrictions

Management Issues

Landscaping (i.e., the introduction of native or nonnative plant species around developed areas) is often in direct conflict with biological objectives. Of particular concern are (1) the introduction of nonnative, invasive plant species that can displace native species in natural communities; (2) horticultural regimes (irrigation, fertilization, pest control, and pruning) that alter site conditions in natural areas, thereby promoting shifts in species composition from a native to a nonnative flora; and (3) genetic contamination from the introduction of native cultivars not collected onsite or in proximity to the site.

Management Recommendations

Because preserve lands are designated as biological open space, active landscaping should be absent or minimal. However, where problems are anticipated in preserve areas due to landscaping in nearby developed areas, the following guidelines should be followed:

1) Control Exotic Plant Species

- Prohibit the use of nonnative, invasive plant species in landscaping palettes in preserve areas or for new public projects immediately adjacent to the preserve. This includes container stock and hydroseeded material.

- Revegetate areas of exotic species removal with species appropriate to the biological goals of the specific preserve area.

- In the Coastal Zone, the use of invasive plant species in the landscaping for developments, such as those identified in Table 12 of the HMP, shall be prohibited.

2) Monitor Horticultural Regimes

- Control irrigation of landscaping material adjacent to the preserve to prevent runoff into the preserve. Irrigation runoff alters conditions in natural areas that are adapted to xeric (dry) conditions, thereby promoting establishment of nonnative plants and displacement of native species. In addition, irrigation runoff can carry pesticides into natural areas, adversely affecting both plants and wildlife.

- Monitor and limit, to the degree feasible, fertilization of ornamental plants on areas draining into the preserve, to reduce excess nitrogen runoff to areas of native vegetation. Excess nitrogen is detrimental to plant mycorrhizal growth and fosters exotic weed invasion. Initiate fertilizer management programs that apply the minimal amount of fertilization required for all public horticultural areas adjoining the preserve.

- Limit ornamental pest control activities adjacent to the preserve, to the degree feasible.

3) Avoid Genetic Contamination

Avoid genetic contamination of native plant species by prohibiting the introduction of cultivars of native species from different geographic regions. If these introductions are similar enough genetically to native species in the preserve, then cross-breeding or hybridization could occur. All stock introduced into the preserve that has the potential for breeding with native species already present onsite should be propagated from material collected in the vicinity. Special attention should be given to the elimination of native plant landscaping cultivars of coastal sage scrub and chaparral species taken from central or northern California locations, or from islands off the coast of southern California.

D. Fencing, Signs and Lighting

Management Issues

Fencing plays an important role in the use of the landscape by humans, domestic animals, and wildlife. Fencing can control human access, particularly off-highway vehicles. Fencing can direct wildlife to road undercrossings and prevent road kills. However, fencing also can restrict normal wildlife movement, restrict access to food and water, and guide wildlife onto roads.

Signs educate, provide direction, and promote the sensitive use and enjoyment of natural areas, but they can also inadvertently invite vandalism and other destructive behavior. Signs that explain the rules of the preserve (campfires, firearms usage, camping, etc.) are most effective at public entrance points. Signs for educational nature trails and on roads near wildlife corridors (to reduce road kills) also should be posted at appropriate locations.

Artificial lighting adversely impacts habitat value of the preserve, particularly for nocturnal species. Therefore, lighting should not be permitted in the preserve

except where essential for roadways, facility use, and safety. Along preserve edges, major highway lighting should be limited to low pressure sodium sources directed away from preserve areas.

Management Recommendations

1) Fencing

- Dismantle existing fencing inside the preserve, except where needed to:
  - ◊ Limit road kills; fencing should be used to funnel wildlife away from at-grade road crossings and toward undercrossings; fencing at wildlife undercrossings should be 10 feet high.
  - ◊ Protect particularly sensitive species or habitats; use perimeter fencing in linkage areas where preserve widths are narrower and there is greater exposure to adverse effects.
  - ◊ Direct human access; limit human access to designated trails using natural vegetation, topography, signs, and limited fencing.
- Design and locate fences within the preserve so they do not impede wildlife movement.

2) Signs

- Provide educational brochures, interpretive centers, and signs to educate the public about the resources and goals of the HMP and preserve.
- Establish signs for access control and education at the periphery of the preserve that are open to human access. Post signs to prohibit firearms and pets.
- Use signs for educational nature trails.
- Limit the use of signs to attract attention to sensitive species, since such designation may invite disturbance of their habitat.
- Use temporary signs to indicate habitat restoration or erosion control areas.
- Use barriers and informational signs to discourage shortcuts.

3) Lighting

- Eliminate lighting in or adjacent to the preserve except where essential for roadway, facility use, and safety and security purposes.
- Use low pressure sodium illumination sources. Do not use low voltage outdoor or trail lighting, spot lights, or bug lights. Shield light sources adjacent to the preserve so that the lighting is focused downward.
- Avoid excessive lighting in developments adjacent to linkages through appropriate placement and shielding of light sources.

E. Predator and Exotic Species Control

Management Issues

Native species are often at a disadvantage after exotic species or nonnative predators are introduced, so special management measures to control exotic species and nonnative predators are recommended. Nonnative plant and animal species have few natural predators or other ecological controls on their population sizes, and they thrive under conditions created by humans. These species may aggressively outcompete native species or otherwise harm sensitive species. When top predators are absent, intermediate predators multiply and increase predation on native bird species and their nests. Feral and domestic animals also prey on small native wildlife species. Agricultural areas, livestock holding areas, and golf courses provide resources for increased populations of parasitic cowbirds, which adversely affect native songbird populations. Litter and food waste from migrant worker camps and picnickers can contribute to an increase in Argentinean ant populations which outcompete native ants, the primary food resource of San Diego horned lizards.

Management Recommendations

1) Feral and Domestic Animal Control

- Document evidence of feral or domestic animal use in the preserve.
- Establish an education program for homeowners regarding responsible pet ownership. The program should encourage (a) keeping pets indoors, especially at night; (b) having pets neutered or spayed to reduce unwanted reproduction and long-range wanderings; (c) belling of cats to reduce their effectiveness as predators; (d) discouraging release of unwanted pets into the wild; and (e) keeping dogs on leashes when walking them on trails in preserve areas.
- Fence areas between selected areas of the preserve and adjacent housing to keep pets out of particularly sensitive areas.
- Establish a feral animal removal program.

2) Cowbird Trapping Program

- Document and monitor the extent of cowbird parasitism on target species nests in the preserve.
- If necessary, establish a cowbird trapping program to increase nesting success of target species affected by cowbird parasitism.

3) Native Predator Control

- Monitor population levels of selected native predators (bobcat, coyote).
- Institute an educational program to explain the role and necessity of large native predators within the ecosystem and the need to protect them from disturbance.
- If key native predator species (coyote, bobcat) are extirpated from the preserve, initiate a program to control mesopredators (gray fox, skunks, raccoon, and opossum).

4) Exotic Plant Control

Prioritize areas for exotic species control based on aggressiveness of invasive species and degree of threat to the native vegetation.

- Eradicate species based on biological desirability and feasibility.
- Use an integrated pest management approach, (i.e., use the least biologically intrusive control methods, at the most appropriate period of the growth cycle, to achieve the desired goals).
- Consider both mechanical and chemical methods of control. Only herbicides compatible with biological goals should be used. Only licensed pest control advisers are permitted to make specific pest control recommendations.
- Properly dispose of all exotic plant materials that are removed from preserve lands (e.g., in offsite facilities).
- Revegetate exotic weed removal areas with species appropriate to biological goals.

5) List of Invasive Exotic Plants

The following is a list of invasive exotic plants occurring or potentially occurring in the City of Carlsbad.

Table 12

INVASIVE EXOTIC PLANTS
Occurring or Potentially Occurring in the City of Carlsbad

Scientific Name	Common Name	Comments
Acacia spp.	Wattle, acacia	Invades wetlands
Ageratina adenophora	eupatory	Invades coastal canyons
Agrostis avenacea	Pacific bent grass	Invades vernal pools
Agrostis stolonifera	creeping bentgrass`	Invades wetlands
Ailanthus altissima	tree of heaven	Invades wetlands
Ammophila arenaria	European beachgrass	Invades coastal dunes
Anagallis arvensis	scarlet pimpernel	Invades wetlands and uplands
Aptenia cordifolia	red apple iceplant	Invades uplands and wetlands
Atriplex semibaccata	Australian saltbush	Invades coastal grasslands, scrub, and marsh
Atriplex glauca	saltbush	Invades uplands
Arcototheca calendula	Capeweed	Invades uplands and wetlands
Arundo donax	giant reed	Invades riparian areas
Asclipias sp.	Milkweed	Common weed
Avena harbata	slender wild oat	Non-native grass; invades grasslands
Avena fatua	wild oat	Non-native grass; invades grasslands
Bassia hyssopifolia	bassia	Invades alkaline habitats
Brassica nigra	black mustard	Common weed in uplands
Bromus spp.	Brome grasses	Non-native grass; invades glasslands
Carpobrotus edulis	ice plant	Invades coastal communities
Centaurea melitensis	tocalote	Invades grasslands
Chenopodium ambrosioides	Mexican tea, goosefoot	Common wetland weed
Chrysanthemum sp.	Daisy	Commonly invades uplands and wetland edges
Cirsium arvense	Canada thistle	Invades riparian areas
Cirsium vulgare	bull thistle	Invades riparian areas, marshes, meadows
Conium maculatum	poison hemlock	Mainly in disturbed areas
Conyza canadensis	horseweed	Invades uplands
Cortaderia jubata	Andean Pampas grass	Invades coastal habitats
Cortaderia selloana	Pampas grass	Invades coastal habitats/wetlands
Cotula coronopifolia	brass buttons	Invades wetlands
Cynara cardunculus	artichoke thistle	Invades grasslands and uplands
Cynodon dactylon	Bermuda grass	Invades wetlands and uplands
Cyperus involucratus	African umbrella-plant	Invades wetlands
Cytisus scoparius	Scotch broom	Invades coastal scrub, oak woodlands
Delairia odorata	Cape ivy	Invades coastal and riparian areas
Eucalyptus globulus & other species	Tasmanian blue gum / eucalyptus	Spreads in riparian areas, grasslands, moist slopes
Erodium spp.	Filaree	Common weed
Fircus carica	edible fig	Invades riparian woodlands
Foeniculum volgare	fennel	Invades grasslands, roadsides

Scientific Name	Common Name	Comments
Gastridium ventricosum	nit grass	Invades vernal pools
Hedera canariensis	Algerian ivy	Invades wetlands
Hedera helix	English ivy	Spreads in riparian areas
Hordeum spp.	Barley	Non-native grass; invades grasslands
Hydrilla verticillata	hydrilla	Invades wetlands
Hypochaeris glabra	smooth cat's ear	Common weed
Lactuca serriola	prickly or wild lettuce	Invades wetlands
Lepidium latifolium	perennial pepperweed	Invades marshes
Lolium spp.	Rye	Non-native grass; invades grasslands
Lonicera japonica	Hall's honeysuckle	Invades wetlands
Medicago sp.	Black medic	Invades uplands
Melilotus spp.	Sweet-clover	Invades wetlands and uplands
Messembryanthemum crystallinum	crystalline ice plant	Invades coastal bluffs, scrub and grasslands
Myoporum laetum	myoporum	Invades wetlands
Myriophyllum acquaticum	parrot's feather	Invades streams, lakes, ponds
Nicotiana glauca	tree tobacco	Invades wetlands
Pennisetum clandestinum	Kikuyo grass	Non-native grass; invades grasslands
Pennisetum setaceum	fountain grass	Invades grasslands, roadsides
Phalaria aquatica	Harding grass	Invades coastal sites
Phragmites communis	Reed	Invades brackish wetlands
Piptatherum miliaceum	smilo grass	Invades wetlands
Plantago sp.	Plantain	Invades wetlands and uplands
Polypogon monspeliensis	annual beard grass/rabbit's foot	Invades vernal pools
Reama monsperma	bridal broom	Invades coastal scrub, oak woodland
Ricinus communis	castor-bean	Invades coastal riparian and upland habitats
Rorippa nasturtium-acuaticum	water cress	Invades wetlands
Rubus discolor	Himalayan blackberry	Invades riparian areas, marshes, oak woodlands
Salsola iberica	Russian thistle	Invades wetlands and uplands
Senecio mikanioides	German ivy	Invades wetlands
Schinus molle	Peruvian peppertree	Invades wetlands
Schinus terebinthifolius	Brazilian pepper	Invades riparian areas
Sonchus spp.	Sow thistles	common weed
Spartium junceum	Spanish broom	Invades coastal scrub, oak woodland; roadcuts
Tamarix spp.	Tamarish, salt cedar	Invades riparian areas
Tropaeolum majus	garden nasturtium	Invades wetlands
Vivia villosa	hairy vetch	Invades wetlands and uplands
Vinca major	periwinkle	Invades riparian areas, oak woodlands
Washington filifera	fan palm	Invades wetlands
Xanthium strumarium	cocklebur	Invades wetlands

4. Institutional Arrangement and Guidelines for Habitat Management

Roles and responsibilities for management of conserved habitat will be specified in the Implementation Agreement. In general, management of conserved habitat within the preserve system will occur through a combination of existing institutional arrangements for public lands and existing reserves and arrangements identified for lands added to the system over time. To assist with and coordinate day to day management of conserved habitat, the City will select or form an entity for that purpose. The City may also request technical assistance or seek advice on specific issues from other parties with expertise in those areas. For example, the California Department of Forestry and Fire Protection and the City's Fire Marshal would be consulted regarding fire management and emergency response in areas within and adjacent to conserved habitat. Existing reserve managers (such as the University of California Natural Reserve System) would be consulted regarding habitat management in and adjacent to their reserves.

If regional institutional arrangements for habitat management are established in connection with the MHCP/NCCP planning efforts, some or all of the management activities for the HMP preserve system ultimately could be merged with the regional program.

5. Zone-level Recommendations

This section summarizes preserve management goals and guidelines for each of the City's 25 Local Facilities Management Zones (Zones). These zone-specific goals supplement the general preserve management guidelines presented above, which apply generally throughout the city's preserve system. These zone-specific goals serve to focus overall preserve management based on more site-specific biological conditions by highlighting specific management issues within each zone.

Zone 1

Prepare and implement fire management plans to minimize removal of conserved habitats to the extent feasible, given safety concerns. Use fencing and signs, as necessary, to minimize human intrusion in or near nesting, loafing, or roosting areas for HMP species, such as pelicans, terns, and rails.

Zone 2

Manage preserve areas to increase breeding habitat value for California gnatcatchers. Improve the regional gnatcatcher linkage by restoring grasslands to sage scrub and enhancing gnatcatcher nesting habitat via a habitat enhancement plan. Any conversion of grassland to coastal sage scrub should avoid impacts to narrow endemic species. Restrict fuel reduction for fire management to areas immediately adjacent to existing housing, and minimize removal of natural habitats to the extent feasible, given safety concerns.

Zone 3

No zone-specific preserve management guidelines.

Zone 4

No zone-specific preserve management guidelines.

Zone 5

Restore or enhance sage scrub habitat within the north-south linkage between Palomar Airport Road and Veteran's Memorial Park. Maintain, enlarge, or create sage scrub patches of sufficient size (minimum 6 acres) and quality, based on site

data and the biology of the species, to support six gnatcatcher breeding territories between Palomar Airport Road and Veteran's Memorial Park. Patches should be contiguous, with no more than 800 feet between any two patches. Any restoration of grassland to coastal sage scrub should avoid impacts to narrow endemic species. Transplantation of any minor narrow endemic populations, not deemed critical populations, may be considered as a management option if onsite preservation is not feasible. Such transplantation shall be done in consultation with the Wildlife Agencies. Said transplantation should be treated as experimental, with detailed monitoring and management plans prepared in advance. Implement exotic species removal measures, if necessary, to protect habitat values against such invasive species as pampas grass and giant reed.

Zone 6

Restrict fuel reduction for fire management to areas immediately adjacent to existing housing, minimizing the removal of natural habitats to the extent feasible, given safety concerns.

Zone 7

Manage preserve areas to maintain and enhance breeding habitat value for California gnatcatchers. Remove exotic plant species, including eucalyptus trees, from within natural habitat areas and linkages. Restrict fuel reduction for fire management to areas immediately adjacent to existing housing, minimizing the removal of natural habitats to the extent feasible, given safety concerns.

Zone 8

Restore and enhance coastal sage scrub, southern maritime chaparral, marsh, and riparian habitats. Develop restoration, management, and monitoring plans for sensitive species occurring in these habitats. Create new marsh and wetland habitat by converting disturbed upland habitat where hydrology is appropriate for wetland vegetation. Implement exotic species removal measures, if necessary, to protect habitat values against such invasive species as pampas grass and giant reed. Implement cowbird trapping programs, as needed. Prepare a management and monitoring plan to minimize adverse water quality impacts upstream of the Agua Hedionda Lagoon system. Restrict fuel reduction for fire management to areas immediately adjacent to existing structures, minimizing the removal of natural habitats to the extent feasible, given safety concerns.

Zone 9

Monitor breeding populations of terns, plovers, and sparrows, and continue predator control programs where necessary. Use fencing and signs, as necessary, to minimize human intrusion in or near nesting, loafing, or roosting areas for HMP species, such as pelicans, terns, and rails.

Zone 10

Manage the dedicated biological open space consistent with the Villages of La Costa HCP Guidelines. Develop management and monitoring plans for sensitive species occurring in the conserved areas. Restrict fuel reduction for fire management to areas immediately adjacent to existing housing, and minimize removal of conserved habitats to the extent feasible, given safety concerns.

Zone 11

Manage the dedicated biological open space consistent with the Villages of La Costa HCP Guidelines. Develop management and monitoring plans for sensitive species occurring in the conserved areas. Restrict fuel reduction for fire management to areas immediately adjacent to existing housing, and minimize removal of conserved habitats to the extent feasible, given safety concerns.

Zone 12

Manage the dedicated biological open space consistent with HMP guidelines. Develop management and monitoring plans for sensitive species occurring in the conserved areas. Restrict fuel reduction for fire management to areas immediately adjacent to existing housing, and minimize removal of conserved habitats to the extent feasible, given safety concerns. Implement exotic species removal measures, if necessary, to protect habitat values against such invasive species as pampas grass and giant reed.

Zone 13

Enhance and restore disturbed habitat areas within biological open space with appropriate natural vegetation. Implement exotic species removal measures, if necessary, to protect habitat values against such invasive species as pampas grass and giant reed. Monitor the California least tern, western snowy plover, Belding's Savannah sparrow, and least Bell's vireo populations, and implement predator control programs and cowbird trapping programs where necessary.

Zone 14

Prepare and implement restoration plans to create a continuous and viable habitat linkage connecting Core Areas 3 and 4 (Linkage Area B). The linkage should include a mosaic of natural habitats, such as coastal sage scrub, grassland, and riparian vegetation communities, in a natural configuration that takes into account topography, hydrology, and existing vegetation. Implement exotic species removal measures, if necessary, to protect habitat values against such invasive species as pampas grass and giant reed. Restrict fuel reduction for fire management to areas immediately adjacent to existing housing, and minimize removal of conserved habitats to the extent feasible, given safety concerns.

Zone 15

Manage preserve areas for habitat value for California gnatcatchers. Restore or enhance coastal sage scrub to improve connectivity and gnatcatcher nesting habitat within Linkage Area C. Restrict fuel reduction for fire management to areas immediately adjacent to existing housing, and minimize removal of conserved habitats to the extent feasible, given safety concerns. Remove exotic plant species, including eucalyptus trees and pampas grass, from within natural habitat areas and linkages.

Zone 16

Manage preserve areas for habitat value for California gnatcatchers and other sage scrub species. Restrict fuel reduction for fire management to areas immediately adjacent to existing development, and minimize removal of conserved habitats to the extent feasible, given safety concerns. Remove exotic plant species, including eucalyptus trees and pampas grass, from within natural habitat areas and linkages.

Zone 17

Restore and enhance coastal sage scrub and riparian habitat to improve habitat connectivity and quality within preserve areas. Restrict fuel reduction for fire management to areas immediately adjacent to existing housing, and minimize removal of conserved habitats to the extent feasible, given safety concerns. Remove exotic plant species, including eucalyptus trees and pampas grass, from within natural habitat areas and linkages.

Zone 18

Manage to maintain and enhance narrow endemic plant populations, gnatcatcher nesting habitat, and wildlife movement habitat. Restore or enhance coastal sage scrub to improve connectivity and value as gnatcatcher nesting habitat. Implement exotic species removal measures, if necessary, to protect habitat values against invasive plant species. Restrict fuel reduction for fire management to areas

immediately adjacent to existing housing, and minimize removal of conserved habitats to the extent feasible, given safety concerns.

Zone 19

Manage to maintain narrow endemic plant populations and wildlife movement habitat. Restore or enhance coastal sage scrub and southern maritime chaparral. Restrict fuel reduction for fire management to areas immediately adjacent to existing housing, and minimize removal of conserved habitats to the extent feasible, given safety concerns. Monitor California least tern, western snowy plover, and Belding's savannah sparrow populations, and implement predator control programs, where necessary.

Zone 20

Manage preserve areas for habitat value for California gnatcatchers and narrow endemic plants. Restore and enhance disturbed areas contiguous with conserved habitats. Restrict fuel reduction for fire management to areas immediately adjacent to existing housing, and minimize removal of conserved habitats to the extent feasible, given safety concerns.

Zone 21

Manage preserve areas for habitat value for California gnatcatchers and narrow endemic plants. Restrict fuel reduction for fire management to areas immediately adjacent to existing housing, and minimize removal of conserved habitats to the extent feasible, given safety concerns.

Zone 22

Manage vernal pool habitat to minimize adverse edge effects and maintain/enhance water quality of the pools. Stabilize sensitive species populations by removing impacts or potential impacts, including trampling, vehicular traffic, illegal dumping, collecting, and invasion of non-native plants. Use fencing and signs to restrict human intrusion and educate the public about vernal pool resources. Implement runoff or erosion control measures on adjacent properties, as necessary, to maintain appropriate amounts of water runoff into pool watersheds, while protecting water quality against potential pollutants. Monitor the status of preserved populations to ensure they remain viable.

Zone 23

Manage to avoid edge effects on the natural habitats in this zone. Develop management and monitoring plans for the narrow endemic species and riparian bird species. Implement a fire management program in the southern maritime chaparral, as feasible, and cowbird trapping in the riparian areas, as necessary. Ensure that existing agriculture and future development activities do not encroach on the riparian buffer area. Implement exotic species removal measures, if necessary, to protect habitat values against such invasive species as pampas grass and giant reed.

Zone 24

Develop management and monitoring plans for the narrow endemic species. Manage the coastal sage scrub for gnatcatcher breeding and movement. Implement exotic species removal measures, if necessary, to protect habitat values against such invasive species as pampas grass and giant reed.

Zone 25

Manage riparian habitat to maintain vireo nesting habitat quality. Implement cowbird trapping as necessary. Implement exotic species removal measures, if necessary, to protect habitat values against such invasive species as pampas grass and giant reed. Manage upland areas as California gnatcatcher nesting habitat. Restore and enhance the existing grassland and coastal sage scrub mosaic to increase connectivity of coastal sage scrub patches and improve gnatcatcher nesting habitat

value. Any conversion of grassland to coastal sage scrub should avoid impacts to narrow endemic species.